

REMARK/ARGUMENTS

Favorable reconsideration of this application is requested in view of the above amendments and in light of the following remarks and discussion.

Claims 1-14 are pending. Claims 1-6 are withdrawn. Claim 7 is amended. Support for the amendment to Claim 7 can be found in Fig. 3, for example. Support for newly added Claims 13 and 14 can be found in Fig. 3, for example. No new matter is added.

In the outstanding Office Action, Claims 7-12 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claim 7 was rejected under 35 U.S.C. § 102(a) as anticipated by Haji (Japanese Patent No. 10-302998, herein "Haji"). Claims 7-9 and 11-12 were rejected under 35 U.S.C. § 103(a) as obvious over Koshiishi et al. (U.S. Patent No. 5,919,332, herein "Koshiishi") in view of Haji or Yada et al. (Japanese Patent No. 2002-359203, herein "Yada"). Claim 10 was rejected under 35 U.S.C. § 103(a) as obvious over Koshiishi in view of Haji or Yada and further in view of Tsuchiya et al. (U.S. Patent No. 5,716,534, herein "Tsuchiya").

Regarding the rejection of Claims 7-12 as failing to comply with the written description requirement, that rejection is respectfully traversed by the present response.

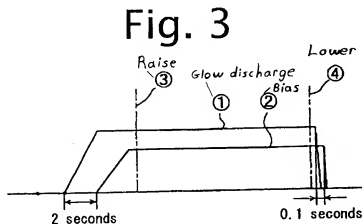
Amended independent Claim 7 recites, in part

wherein the drive mechanism maintains the spacing at a first spacing after the time of plasma ignition,
wherein the drive mechanism subsequently sets the spacing from the first spacing directly to a second spacing, which is larger than the first spacing, before the time of plasma extinction.

Accordingly, the drive mechanism sets the spacing between the lower electrode and upper electrode to a first spacing after the time of plasma ignition. The drive mechanism subsequently sets the spacing from the first spacing directly to the second spacing. The second spacing is larger than the first spacing. The adjustment to the second spacing is done before the time of plasma extinction.

In reference to Figures 2B and 2C, Applicants respectfully submit that Fig. 2B is a sectional view illustrating the upper and lower electrodes set to the first spacing, and Fig. 2C is a sectional view illustrating the upper and lower electrodes to the second spacing.¹

One non-limiting example of the above-noted features is shown in Fig. 3. An annotated version of Fig. 3 is provided below.



Accordingly, the drive mechanism raises the lower electrode at point (3) as shown in annotated Fig. 3 above. By the time the action described in point (3) occurs, the glow discharge is already ignited. The glow discharge shown in item (1) continues for a period of time after the lower electrode is raised. Accordingly, the feature “wherein the drive mechanism maintains the spacing at a first spacing after the time of plasma ignition” is fully supported in Fig. 3.

Additionally, at point (4) in the example shown in Fig. 3, the lower electrode is lowered such that the spacing becomes the “second spacing.” As further shown in the example depicted in Fig. 3, the lowering described in point (4) occurs before the glow discharge (1) is extinguished. Accordingly, Applicants respectfully submit that the feature “wherein the drive mechanism subsequently adjusts the spacing from the first spacing directly to a second spacing, which is larger than the first spacing, before the time of plasma extinction” is fully supported by at least Fig. 3. Applicants further respectfully submit that

¹ See page 16, line 22 – page 17, line 13, for example.

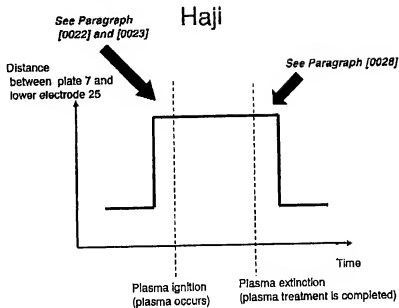
the rejection of independent Claim 7 as failing to comply with the written description requirement is overcome. Claims 8-12 depend from amended independent Claim 7, and Applicants respectfully submit that the rejection of these claims by virtue of their dependency from independent Claim 1 is also overcome.

Regarding the rejection of Claim 7 as anticipated by Haji, that rejection is respectfully traversed by the present response.

As discussed above, amended independent Claim 7 recites that the drive mechanism maintains the spacing at a first spacing after the time of plasma ignition. The drive mechanism subsequently adjusts the spacing from the first spacing to a second spacing before a time of plasma extinction. The second spacing is larger than a first spacing.

One benefit of the above-noted configuration is the increase in stability of plasma processing during the time the lower electrode is positioned at the first spacing. The inclusion of the second, larger spacing facilitates reduction in charging damage to the object being processed at the time of plasma extinction.

In contrast, Haji describes an arrangement in which the plasma ignition occurs and extinguishes while a distance between the plate (7) and lower electrode (25) is at its largest. As shown in the following figure describing the process used by Haji, and discussed in numbered paragraphs [0022] and [0023] of Haji, “the volume of the processing room (P) is increased” during plasma processing.



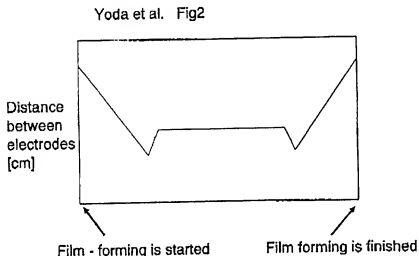
Numbered paragraph [0023] describes that plasma processing occurs while the distance between the upper plate (25) and lower electrode (7) is large, as shown in the illustration above. Numbered paragraph [0028] of Haji describes that, **when plasma treatment is completed, the motor (28) will be driven, and the upper plate (25) will be dropped, and the distance between the upper plate (25) and the lower electrode (7) will be reduced.** Accordingly, Haji does not teach or suggest that the drive mechanism maintains the spacing at a first spacing (smaller spacing) after a time of plasma ignition. Nor does Haji teach or suggest that the drive mechanism subsequently adjusts the spacing from the first spacing to a second spacing, which is larger than the first spacing, before the time of plasma extinction as recited in amended independent Claim 7. Rather, Haji maintains a large space between the plate (25) and electrode (7) during processing, and after processing, reduces the distance between the plate (25) and electrode (7). Accordingly, Applicants respectfully submit that amended independent Claim 7 patentably distinguishes over Haji for at least the reasons discussed above.

Regarding the rejection of Claims 7-9 and 11-12 as obvious over Koshiishi in view of either Haji or Yada, that rejection is respectfully traversed by the present response.

The outstanding Office Action acknowledges that Koshiishi fails to teach a drive mechanism that sets a spacing from a first spacing to a second spacing before a time of plasma extinction and after the time of plasma ignition, wherein the second spacing is larger than the first spacing, and the outstanding Office Action relies on either of Haji or Yada for these features.²

However, Applicants respectfully submit that, as discussed above, Haji fails to teach or suggest the above-noted features.

Yada fails to teach or suggest that a drive mechanism subsequently sets the spacing from the first spacing directly to a second spacing, which is larger than the first spacing, before the time of plasma extinction. Instead, as shown in the following annotated version of Fig. 2 of Yada, the processing spacing (horizontal line in the middle of Fig. 2) is directly followed by a sharp decrease in distance between the electrodes, not an increase in spacing as recited in amended independent Claim 7.



Thus, Yada does not maintain a first spacing followed by a direct setting to a second, larger spacing before extinguishing a plasma as recited in amended independent Claim 7.

Accordingly, Applicants respectfully submit that Yada fails to remedy the deficiencies acknowledge in the outstanding Office Action regarding Koshiishi, and Claims

² Outstanding Office Action, page 5.

7-9 and 11-12 patentably distinguish over any proper combination of Koshiishi with Haji or Yada for at least the reasons discussed above.

Regarding the rejection of Claim 10 as obvious over Koshiishi in view of Haji or Yada and further in view of Tsuchiya, that rejection is respectfully traversed by the present response.

Claim 10 depends from amended independent Claim 7 and patentably distinguishes over any proper combination of Koshiishi with Haji or Yada.

Tsuchiya is relied on in the outstanding Office Action for the feature of turning off a second high frequency power before turning off a first high frequency power higher than the second high frequency power. However, Tsuchiya fails to remedy the deficiencies discussed above regarding any proper combination of Koshiishi and Haji or Yada. Rather, as discussed in the previous response, Tsuchiya does not teach or suggest that an adjusting mechanism has a drive mechanism configured to make a spacing larger before a time of plasma extinction than a spacing during plasma processing. Accordingly, Applicants respectfully submit that no proper combination of the cited references would include all of the features recited in amended independent Claim 7 or Claim 10 depending therefrom.

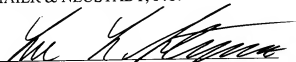
Newly added dependent Claims 13 and 14 depend from Claim 7 and patentably distinguish over any proper combination of the cited references for at least the same reasons as Claim 7 does.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. A Notice of Allowance for Claims 7-14 is earnestly solicited.

Should Examiner Crowell deem that any further action is necessary to place this application in even better form for allowance, she is encouraged to contact Applicants' undersigned representative at the below-listed telephone number.

Respectfully submitted,

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